

Step 11 - Install shoring in the base of the recharge basin. Specific shoring requirements are presented in Section 1.6.8. This remedial work can be completed concurrently with Steps 1 through 10.

Step 12 - Excavate all soils and sediment within the shored area of Sump 3. Scarify or remove top layer of fine-grained sediments in a small area of Sump 3 to allow standing water to drain. Repeat as needed to completely drain Sump 3. Continue excavation activities until the designated depth of 10 feet below the base of the existing sump has been achieved.

Step 13 - Backfill excavated areas of Sump 3.

1.6.2 Foundation

The pilot plant's foundation has been in contact with soils in the Direct Spill Area. The concrete surface shall be cleaned if oil residue is visually observed. The decision to clean the concrete foundation shall be determined by the Owner's Site Representative.

The decontamination procedure for concrete shall require the removal of a thin layer, approximately 1/16 of an inch, by Contractor using standard scarifying techniques. The scarifying equipment shall operate pneumatically using high-speed, reciprocity tungsten-carbide tipped piston needles to pulverize the concrete surface. Each scarring machine shall be equipped with a vacuum flow designed to ensure that dust, debris and airborne contaminants shall not be emitted. The scarified material from the concrete surface shall be vacuumed into a controlled disposal drum which shall be filled, sealed, removed and replaced under vacuum conditions to minimize the emission of airborne contaminants. All waste generated during

the scarifying activities shall be stored and disposed of in accordance with procedures presented in Section 1.8 by the Contractor.

1.6.3 Non-Porous Media

Non-porous surfaces within the Direct Spill Area, such as steel flashings, railings and steel piping and conduits, may have also been in contact with PCBs. The non-porous external surfaces of each object shall be decontaminated by the Contractor by swabbing the surfaces which have contacted PCBs with a solvent containing 5-percent solubility or more by weight to PCBs. All solvent and swabbing material shall be disposed of by the Contractor as PCB material, in accordance with disposal procedures presented in Section 1.8.6.

1.6.4 Dust Control

The Contractor shall be responsible for taking appropriate measures to reduce the potential of dust, that may contain PCBs on particulate matter, from becoming airborne during the excavation process. The control measures shall include wetting of the excavation surfaces, loading and unloading of soil during periods of low wind, and covering exposed soils.

Wetting shall be completed by sparingly spraying water on active excavations. The wetting shall be done on an as-needed basis by the Contractor or at the direction of the Owner's Site Representative and shall be done in a manner such that the soils do not become excessively wet. The Contractor shall provide the necessary equipment to wet the soils.

To the extent possible, soil excavation and loading activities shall be completed during periods of low wind. These activities shall be temporarily suspended during wind gusts. The Contractor shall be responsible for temporarily suspending loading and unloading activities during occasional wind gusts. The Owner's Site Representative is responsible for suspending work during sustained periods of high wind.

All exposed soil surfaces, including open excavations, soil stockpiles, containerized soil, and soil in trucks or rail cars, shall be covered with plastic tarps when not in active use. Active excavations shall be covered at the end of each work day. All tarps shall be secured to prevent movement. The plant speed limit of 5 mph shall also be observed by all vehicles.

1.6.5 Excavation Depth Control

The depths of excavations to be achieved by the Contractor are shown on plate 2. All areas within the defined depth contours shall be initially excavated to the depths designated by the outer contours. The Contractor shall excavate to within plus or minus three inches (± 3) of the target depths as defined by the contours. The Contractor shall not exceed the target depth unless directed by the Owner's Site Representative. All depths shall be referenced from existing grade and tied into one control point located in each Work Area. The Contractor shall use a level and rod to control the depth of excavation.

1.6.6 Hand Excavation

Known and suspected below-grade utilities are shown on plate 2. Although every attempt has been made to identify and locate below-grade utilities, others may exist. Therefore, excavation over the entire site should proceed with caution. In most cases, the utilities are expected to be within the required excavation depths and, therefore, shall be a factor. The Contractor shall screen each area to be excavated in advance of the start of work with a metal detector. However, the Contractor shall be aware that some of the below-ground utilities are composed of non-ferrous material such as transite. The Contractor shall dig by hand in the areas of buried utilities, at his discretion, until the buried utilities are located and uncovered or until the required depth is

achieved. Utility lines that are completely unearthed must be supported until the excavation is backfilled and material is placed to support the utility. Settling basins and storm-water piping, as discussed in Section 1.6.7, are the only exceptions to the requirements of this section.

1.6.7 Storm Sewers and Settling Basins

Concrete pipe storm sewers, with associated settling basins, are shown on plate 2. In order to complete the required excavation, the Contractor may remove the storm sewer and the associated settling basins. Removal of these items shall be done in such a manner that facilitates replacement of the storm sewer after completion of excavation. To this end, the Contractor shall break any storm sewer pipes entering Work Areas at the nearest joint outside the Work Areas. Alternatively, the pipes can be cleanly cut to provide an end suitable for connection at a later time. Once these breaks have been made, the Contractor may remove the pipe and settling basins inside the Work Areas in an appropriate manner. All concrete pipe and settling basins are to be broken into pieces no larger than 6 inches and disposed of in the same manner as the soils adjacent to the pipe. The cast iron frames and grates or covers from the existing settling basins shall be saved for installation with new settling basins and storm sewers, as described in Section 1.10.2.

1.6.8 Shoring

The Contractor shall install shoring as required in at least two areas of the site. Shoring, composed of drive soldier beams and wood lagging equipped with contact sheeting clip assembly, will be installed in the areas shown on plate 3. A copy of the shoring method is presented in Appendix 2-1. Shoring is required to provide soil stabilization and to minimize the volume of soil requiring excavation. Shoring areas include the Direct Spill Area (Work Area J) and

Sump 3, as shown on plate 3. Excavation depths in the Direct Spill Area shall extend to a minimum of 10 feet below grade, as indicated on plate 2. Excavation in Sump 3 shall terminate at a depth of 10 feet below grade. The Contractor shall install sheet piling, accompanied by all necessary wales, connections and struts, along the perimeter of the shored areas. The sheet piling shall be installed to a depth of 20 feet below grade and shall meet OSHA size and placement requirements so that the soils outside the Work Area are supported and no movement can occur. All shoring shall be removed after the excavations have been backfilled.

In Work Area J, the Contractor shall excavate soils adjacent to the pilot plant down to the base of the footing or foundation. There is no information available regarding the location, dimensions and depth of the pilot plant footings or foundation. When the Contractor has reached the bottom of the footing, the Contractor shall design and install shoring, as required, that shall enable soil excavation to continue to the required depth without threat of damage to the pilot plant. The Contractor shall also shore or support all utilities and piping. The Contractor shall support all below-grade utilities that are exposed as part of the remediation. The Contractor shall also be required to provide shore or supports for the foundations of all overhead piping racks or structures. The Contractor shall be responsible for all damage to structures or underground utilities resulting from soil movement due to improper or inadequate shoring.

In Sump 3, the depth requirement for installation of sheet piling of 20 feet below grade shall be referenced from the bottom of the sump. The Contractor may choose to extend the sheet piling to above grade level at the top of the sump and install and support the piling in such a manner so that the area outside the piling can be backfilled on one or more sides of the sump to establish a bench for equipment to work on.

1.6.9 Re-excavation Procedures

Verification sampling after initial excavation of the Work Areas shall be completed by the Owner's Site Representative. The Owner's Site Representative shall collect the required soil samples and form all necessary split samples, composites or duplicates. Composite soil samples of the excavation shall be submitted to the onsite laboratory, supplied by the Contractor as discussed in Section 1.4.1 for analysis of PCB content. Specific analytical requirements for the onsite laboratory are described in Section 1.7. Results of the verification sampling shall determine whether additional excavations of a Work Area are required. Verification analysis results completed by the Contractor shall be reported to the Owner's Site Representative. The turnaround time between sample acquisition, analysis and reporting shall be completed in a sufficient manner as to not adversely affect the momentum of ongoing site activities. In no case shall the turnaround time exceed eight hours from sample delivery to the onsite laboratory.

Verification sample results found to have PCB concentrations equal to or greater than 10 ppm shall be considered to be above the project's performance objectives; PCB concentrations less than 10 ppm shall be determined to be in accordance with the projects objectives. If results in excess of 10 ppm are obtained from the onsite laboratory, the Owner's Site Representative shall delineate the area that required additional soil removal. The Contractor shall then re-excavate the identified location. The re-excavations shall be completed in 1-foot lifts or at depth increments specified by the Owner's Site Representative. The re-excavated area shall be resampled to verify that the residual PCB concentration in the soils is less than 10 ppm. Stand-by time, as a result of delays in sample analysis by the onsite laboratory, shall be the responsibility of the Contractor.

1.7 Analytical Services

The Contractor shall supply trained laboratory personnel, required equipment and analytical services for the following tests: air monitoring, waste-classification testing and soil analysis for Aroclor 1248. Air monitoring results shall be used to assess work-site conditions during remedial activities. Analytical results of the waste-classification sampling shall be used to demonstrate the characteristics of the waste prior to transport and disposal. Verification soil samples shall be analyzed to determine residual PCB soil concentrations in the Direct Spill Area and Transport Related Area.

For all analytical services, the Contractor shall provide the Owner's Site Representative a project organization and responsibility chart. The Contractor shall provide resumes for all analytical personnel assigned to the project. The Contractor shall also submit a Statement of Qualifications for all requested analytical programs.

The Contractor shall supply all equipment, including field tools, analytical instruments and necessary supplies to meet the specific analytical requirements. The Contractor shall ensure that all equipment is in good working condition and capable of performing precisely and accurately. The Contractor shall complete all routine preventative maintenance measures to ensure proper equipment operation. The Contractor shall develop standard maintenance procedures for all analytical equipment and for proper documentation of all maintenance programs.

1.7.1 Analytical Methods

1.7.1.1 Air Sampling

The Contractor shall supply all equipment necessary to collect continuous real-time air monitoring data for particulates at the work site. The real-time particulate monitoring device shall be a GCA Miniram aerosol monitor or performance equivalent. The equipment must be able to collect and measure

particulates in the micrograms per cubic meter (ug/m^3) range. The Contractor shall calibrate and operate the real-time particulate monitoring equipment.

The Contractor shall be required to supply all equipment and analytical services necessary to collect time-weighted average air samples, then analyze the samples for particulates and Aroclor 1248 on particulates. Particulate samples shall be collected on the perimeter of the Work Areas and shall consist of one upwind and two downwind sampling locations. The air monitoring locations shall be selected by the Owner's Site Representative based upon an onsite wind gage. Equipment and procedures for the perimeter monitoring shall consist of:

Parameter	Unit of measurement	Method	Equipment
Particulates	ug/m^3	NIOSH 500	Dupont Alpha-1 air monitoring sampler
Aroclor 1248	ug/m^3	NIOSH 5503	Dupont Alpha-1 air monitoring sampler

The Contractor shall set-up, calibrate, collect and analyze all time-weighted average air sampling events. Air samples will be collected in accordance with the Field Sampling Plan, Section 3.0.

1.7.1.2 Waste Classification

Waste classification soil samples shall be collected by the Owner's Site Representative. Eleven (11) waste-classification samples shall be collected during the remedial activities. The Contractor shall analyze the waste-classification soil samples for ignitability, reactivity, corrosivity and toxicity by the Toxicity Characteristic Leaching Procedure

(TCLP). Table 1 presents the analytical parameters, method references, holding times and container types required for the toxicity testing.

Ignitability testing shall be completed by testing the soil sample for flashpoint using a Pensky-Martens closed-cup tester and test method described in SW-846, third edition, Method 1010, or by using a Setaflash closed-cup tester and test method described in SW-846, third edition, Method 1020.

Corrosivity testing shall be completed using the EPA test method of pH specified as Method 5.2 in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods".

The determination of reactivity shall be based upon the cyanide or sulfide bearing properties of the waste. Test methods to determine hydrogen cyanide or hydrogen sulfide are presented in SW-846, third edition, Section 7.3.

1.7.1.3 Verification Samples

The Owner's Site Representative shall collect all verification soil samples. The verification soil samples shall be tested by the Contractor to determine the residual PCB concentration in the excavations.

The Contractor shall perform all verification analysis. Verification testing shall be completed at the Ruco site to rapidly determine Aroclor 1248 concentrations in the soil. Verification analysis shall be performed in accordance with SW-846, third edition, Method 8080 or a field method prepared by the USEPA to determine residual PCB concentrations. The analytical technique shall require the use of a packed florisol column gas chromatogram equipped with a linearized electron capture detector. All equipment necessary to weigh, clean-up, extract and analyze the verification soil samples shall be provided and operated by the Contractor. The method detection limits for the analysis shall, at a minimum, be 1 ppm. The Contractor shall provide for disposal of the laboratory samples following onsite analysis.

1.7.2 Data Reduction and Reporting

All raw data, laboratory notes, dilution documentation and final laboratory results shall be recorded by the Contractor and the resulting reports shall become part of the site record. All raw data and notes shall be validated against calibration and quality control records. All data determined to be invalid shall not be used in the decision-making process, but shall be retained in the site records. Verification soil samples shall be confirmed against 11 split samples, collected by the Owner's Site Representative and submitted to an independent laboratory involved in the Contract Laboratory Program (CLP), retained by the Owner. Results of the confirmation samples analyzed by a CLP laboratory shall be determined to be valid results. Verification samples, analyzed by the Contractor, shall be compared against the CLP results for precision and accuracy.

The Contractor shall supply the Owner and Owner's Site Representative with copies of all analytical data in a laboratory report. The report format must, at a minimum, include the following:

- o sample ID number or code;
- o place of collection;
- o time and date of collection; and
- o data analyzed.

The Contractor shall provide copies of the intended laboratory format prior to beginning the project.

Precision, accuracy and all Quality Assurance/Quality Controls required of the analytical program shall be completed by the Contractor in accordance with SW-846, third edition. At a minimum, the following internal quality control checks shall be performed:

1. Method Blank(s): Method blanks are to be prepared in the laboratory and analyzed to assess possible laboratory contamination.
2. Laboratory Control Samples (Method Spikes): Method spikes (blank spikes) shall be prepared and analyzed. Re-agent grade water is spiked with one or more selected compounds prior to extraction. The recovery of the compound(s) is used as a measure of the accuracy of the sample preparation and analysis procedures. At least 10 percent of the total number of samples analyzed shall also be method spike samples.
3. Calibration Check Sample(s): During the course of analysis, every twentieth sample shall be a calibration check standard. This standard shall be prepared from a "second source", that is, a supplier(s) different from the primary calibration standard. The purpose of this calibration check is to ensure the validity of the calibration standard/
4. Replicate Sample(s): These samples are analyzed in order to establish control and assess the precision of analysis and/or sampling. At least 10 percent of the total number of samples to be analyzed shall be replicated.
5. Matrix-Spiked Sample(s): Matrix-spiked samples are from site(s) sampled in duplicate. This sample is spiked with one or more selected compounds prior to extraction. The recovery of the compound(s) is used as a measure of the accuracy of the sample preparation and analysis procedures. At least

10 percent or the total number of samples analyzed shall also be spiked samples.

6. Control Charts: Precision and accuracy shall be monitored by use of control charts. Accuracy shall be expressed in terms of percent recovery. A minimum of 20 data points are needed to construct the percent recovery control chart. The details of control charting are beyond the scope of this document, but at a minimum shall include the following:

- the average (mean) recovery of 20 analyses (X);
- the standard deviation of the mean (SD);
- an upper and lower warning limit, which is the mean plus or minus two standard deviation units ($X \pm 2 \times SD$); and
- an upper and lower control limit, which is the mean plus or minus three standard deviation units ($X \pm 3 \times SD$).

Percent recoveries shall then be plotted on the control chart to determine whether or not they are acceptable.

7. Surrogate Compounds: Surrogate compounds shall be used to determine extraction efficiency and analytical accuracy as described in USEPA CLP Statement of Work for Inorganic, 12/87 and Organic Analyses, 2/88.

8. Re-agent Quality Control Checks: Re-agent and solvent blanks are prepared in the laboratory and analyzed to determine background of re-agents and solvents used in the routine analysis.

Both performance and system audits shall be completed by the Contractor's Analytical Manager. In addition, personnel from New York State, USEPA or its authorized representatives may obtain access to the laboratories to complete audits.

1.8 Storage, Transport and Disposal

1.8.1 Soils with PCB Concentrations Over 500 ppm

Soils containing concentrations of PCBs in excess of 500 ppm are present in the Direct Spill Area (Work Area J). The Contractor shall assume that the quantity of material requiring excavation, storage, transport and disposal is 36 cubic yards. The Contractor shall assume that the conversion between cubic yards and tons shall be 1 cubic yard is equivalent to 1.3 tons. The Contractor acknowledges that the volume stated above is estimated based on available data and shall make provisions for additional volumes if warranted by site conditions.

1.8.2 Soils with PCB Concentrations Between 10 and 500 ppm

Soils containing concentrations of PCBs between 10 and 500 ppm shall form the bulk of the material excavated from the Hooker/Ruco site. The Contractor shall assume that the quantity of soil containing PCBs between 10 and 500 ppm that shall require storage, transport and disposal shall be 1,170 cubic yards. The Contractor shall assume that the conversion between cubic yards and tons shall be 1 cubic yard equals 1.3 tons. The Contractor acknowledges that the volume stated above is estimated based on available data and shall make provisions for additional volumes if warranted by site conditions.

1.8.3 Storage

The Contractor shall provide all labor and equipment necessary to store PCB soils at the Hooker/Ruco site prior to transport and disposal. The Contractor shall be responsible for storing all PCB soils in accordance with the procedures set forth in 40 CFR 761.65. The Contractor shall provide all marking for the storage containers, as required in 40 CFR 761.40. The Contractor shall provide all labor and equipment to properly handle the PCB soils while in storage. It shall be the Contractor's responsibility to check all PCB containers for leaks while in storage. The Contractor shall provide appropriate approved shipping containers for the storage of the excavated PCB soils. Any container used for the storage of PCB soils shall comply with 49 CFR 178.80, 178.82 or 178.115. Larger containers may be used by the Contractor as long as the container provides equivalent protection against leakage or exposure as containers specified by the Department of Transportation (DOT). Equivalent containers must have the same relative strength and durability and be approved by the Owner's Site Representative and USEPA. The Contractor shall data all stored PCB containers and arrange the storage area so that all stored PCB containers can be located by date of storage.

1.8.4 Transport

The Contractor shall perform all transportation activities during the remedial process in accordance with 40 CFR 262 and 40 CFR 263. The site is served by roads and rail spurs. Use of the rail spurs is limited to a maximum of five cars. The Contractor acknowledges that all use of the Ruco rail spur must be coordinated with the plant operations in such a manner as to minimize disruption to normal plant operations. The Contractor shall supply all labor, containers and transport